

## ***Streptococcus pneumoniae* ~ Vaccines Reduce Risk for Vulnerable Populations**

More deaths in the United States occur from pneumococcal infections than from all other vaccine-preventable diseases combined. Infections caused by *Streptococcus pneumoniae* (pneumococcus) occur most frequently when viral respiratory diseases are prevalent, usually during the winter months. Infants, the elderly, and persons with chronic illness are particularly susceptible. Those with chronic heart or lung disease, sickle cell anemia, HIV infection, or other conditions affecting the immune system have the highest risk for infection.

A common resident of the human respiratory tract, *S. pneumoniae* is also a leading cause of bacterial respiratory infections, including pneumonia, otitis media, and sinusitis. In U.S. children, pneumococcus is the most common cause of invasive bacterial infection, usually bacteremia or meningitis.

### **Prevention**

Pneumococcal vaccines (sidebar) have been available since 1977 but are still underused. Pneumococcal vaccine can be administered concurrently with influenza vaccine by separate injection.

As for other respiratory pathogens that pass person to person by droplet spread or indirectly on articles soiled by respiratory discharges, transmission of *S. pneumoniae* can be reduced by good respiratory etiquette: covering the nose when coughing and sneezing, hand washing, and proper disposal of soiled tissues.

### **Immunization and Incidence Trends**

Reports of pneumococcal infection are decreasing as use of the vaccines increases. For children under age 2 years, CDC surveillance data indicate a 69% decrease in the rate of invasive disease in 2001 com-

pared to 1998–1999. Rates also declined 32% for adults age 20–39 years, and 18% for adults age 65 or older.<sup>1</sup>

In Washington State, data from hospital records indicate a decline in the rates of children 0–4 years hospitalized with diagnoses of pneumococcal pneumonia (48% lower) and meningitis (62% lower) for the combined years 2001–2002, compared to the years 1998–1999.<sup>2</sup>

Clinicians have many opportunities to further reduce the burden of pneumococcal disease by screening patients for vaccination status during office visits and before hospital discharges. According to the National Immunization Survey, pneumococcal vaccination coverage (3 or more doses) among Washington children aged 19–35 months was 25% in 2002, compared to 41% nationally.<sup>3</sup> For persons older than age 65, pneumococcal vaccination reportedly lags behind influenza vaccination coverage and may be less than 60% even among persons with health conditions requiring medical visits.<sup>4</sup>

Efficacy of the PCV7 vaccine for children is reported to be 89% for all pneumo-

*Continued page 2*

### ***In This Issue:***

**Fruit & Vegetable Consumption**  
Page 2

**Changes Coming to *epi*TRENDS**  
Page 2

**Monthly Surveillance Data**  
Page 3

**WWW Access Tips**  
Page 4

### **Pneumococcal Vaccines**

- Polysaccharide vaccine (PPV) targets 23 of the most common *S. pneumoniae* serotypes and is recommended for persons age 2 years and older who have medical risk factors, and for all persons age 65 or older.
- Polysaccharide-protein conjugate vaccine (PCV7), licensed in 2000, targets the seven serotypes most likely to cause invasive disease in children. It is recommended for all children less than age 2 years and medically high-risk children age 2 to 4 years.

## Changes Coming to *epiTRENDS*

Beginning with the July 2004 issue, *epiTRENDS* will no longer be published in a printed format but will be available online only. The newsletter will be redesigned for easier online reading and articles will include links for further information.

To obtain e-mail notification of *epiTRENDS*, please register at: <http://listserv.wa.gov/archives/epitrends.html>. Go to "Join or leave the list." Enter your name and e-mail address, leaving the other default values. If you have questions, please contact us at: [function@u.washington.edu](mailto:function@u.washington.edu).

### *epiTRENDS* online

In its current format, *epiTRENDS* is available at [www.doh.wa.gov/Publicat/EpiTrends/04\\_EpiTrends/2004\\_trend.html](http://www.doh.wa.gov/Publicat/EpiTrends/04_EpiTrends/2004_trend.html). In March and May 2004, issues will be posted between the 14th and the 18th of the month.

## Pneumococcus (from page 1)

coccal serotypes and 97% for invasive disease caused by vaccine serotypes. The CDC Respiratory Disease Branch has developed a tracking system to monitor invasive pneumococcal disease occurring after receipt of at least one dose of PCV7 vaccine in children less than 5 years of age. Information on reporting such cases is available at <http://www.cdc.gov/nip/diseases/pneumo/PCV-survrpts/PCV7-instructions.htm>.

### Drug-resistant *Streptococcus pneumoniae*

The emergence of antimicrobial resistance to the drugs most commonly used for treatment has intensified the need to prevent pneumococcal infections by immunization. Penicillin has been the drug of choice for treating pneumococcal infection since the beginning of the antibiotic era. By the 1990s, the occurrence of penicillin-resistant *S. pneumoniae* and strains resistant to multiple drugs had become widespread. Prevalence of DRSP in the United States shows considerable geographic variation with up to 40% resistance to at least one drug in some locations.

In Washington State, hospitals and laboratories participate in a network of sentinel reporters to provide information on trends of antimicrobial resistance. Comparison of local data for 2002 to national data suggests that susceptibility of invasive isolates from Washington continues to be

higher than the U.S. averages: 83% vs. 73% for penicillin, 98% vs. 83% for third-generation cephalosporins, and 90% vs. 78% for macrolide antibiotics.<sup>5</sup> However, the proportion of invasive isolates with resistance to penicillin is significantly greater for Washington children under age 12 years (37%) than for adults (13%).

A major risk factor for carriage of antibiotic-resistant *S. pneumoniae* is previous antibiotic use. Clinicians play an important role in reducing the impact of drug resistance by eliminating unnecessary antibiotic use for viral respiratory infections, and by educating patients about the potential harm of inappropriate use.

### Educational Materials

Free educational materials to help communicate the risks of unnecessary antibiotic use to patients are available from DOH at [www.doh.wa.gov/Topics/antibiotics.htm](http://www.doh.wa.gov/Topics/antibiotics.htm). The website also includes detailed practice guidelines on appropriate use of antimicrobials for respiratory tract infections, developed in association with the Washington State Medical Association.

### References

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3. <http://www.cdc.gov/nip/coverage/default.htm#NIS>
4. *MMWR* June 29, 2001; 50(25):532–7.
5. Active Bacterial Core Surveillance: <http://www.cdc.gov/ncidod/dbmd/abcs>.

## Challenges in Measuring Fruit and Vegetable Consumption

To encourage healthy eating, the U.S. Department of Agriculture and the American Cancer Society have promoted eating a minimum of five servings of fruits and vegetables per day (the "5 a Day" dietary recommendation). Measuring the extent to which people meet this recommendation can provide information on the effectiveness of public health efforts to increase consumption of these foods. However, the issue of serving size complicates the measure of fruit and vegetable consumption, as a person might eat more or less than one serving (as defined by the Department of Agriculture<sup>1</sup>) at one sitting.

A recently published study by the Washington State Department of Health

examined how measurement method affects estimates of the percentage of people meeting the 5 a Day recommendation.<sup>2</sup> In 1998 DOH assessed the extent to which adults in Washington met the 5 a Day recommendation and compared two methods of measuring fruit and vegetable consumption.

The assessment used a random-digit-dialed telephone survey of non-institutionalized English-speaking civilians, 18 years of age and older. The study used statistical methods to adjust for selection probability and to approximate Washington's population based on age and gender. These methods are identical to those used in the Behavioral Risk Factor Surveillance System (BRFSS), an

*Continued page 4*

# Monthly Surveillance Data by County

December 2003\* – Washington State Department of Health

County	E. coli O157:H7	Salmonella	Shigella	Hepatitis A	Hepatitis B	Non-A, Non-B Hepatitis	Meningococcal Disease	Pertussis	Tuberculosis	Chlamydia	Gonorrhea	AIDS	Pesticides†	Lead\$#
Adams	0	0	0	0	0	0	0	0	0	1	0	0	0	2/38
Asotin	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Benton	0	6	1	0	0	0	0	0	1	33	0	0	0	0/8
Chelan	0	1	0	0	0	0	1	1	0	14	0	1	0	0/16
Clallam	0	0	0	0	0	0	0	0	0	24	1	0	0	0/#
Clark	1	4	0	1	1	0	1	2	1	63	10	3	0	0/13
Columbia	0	0	0	0	0	0	0	0	0	0	0	1	0	0/0
Cowlitz	0	2	0	0	0	0	1	1	0	16	1	0	0	1/26
Douglas	0	1	0	0	0	0	0	0	0	6	0	0	0	0/0
Ferry	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Franklin	0	0	0	0	0	0	0	0	0	14	0	0	0	1/7
Garfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Grant	0	1	0	0	0	0	0	0	0	6	0	0	0	3/148
Grays Harbor	0	1	0	0	0	0	1	0	0	12	1	0	0	1/#
Island	0	0	0	0	0	0	0	0	0	10	4	0	0	0/6
Jefferson	0	0	0	0	0	0	0	0	0	7	0	0	0	0/5
King	1	39	5	1	4	0	3	11	14	483	96	37	0	1/47
Kitsap	0	2	1	0	0	0	0	0	1	82	10	1	0	0/#
Kittitas	2	0	0	0	0	0	0	0	0	6	0	0	0	0/0
Klickitat	0	0	0	0	0	0	1	0	0	3	0	0	0	0/0
Lewis	0	0	0	0	0	0	1	1	1	15	0	1	0	0/0
Lincoln	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Mason	0	1	0	0	0	0	0	0	1	13	1	0	0	0/0
Okanogan	0	1	0	0	0	0	0	0	0	4	0	0	0	0/26
Pacific	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Pend Oreille	0	0	0	0	0	0	0	0	0	5	0	0	0	0/#
Pierce	1	11	2	1	1	1	4	39	2	208	50	0	0	1/24
San Juan	0	0	0	0	0	0	0	0	0	3	1	0	0	0/0
Skagit	1	0	0	0	1	0	1	0	0	69	5	0	0	0/#
Skamania	0	0	0	0	0	0	0	0	0	5	0	0	0	0/0
Snohomish	1	10	2	1	5	0	1	3	2	147	13	2	0	0/5
Spokane	3	7	1	0	2	0	4	1	0	109	6	3	1	0/20
Stevens	0	1	0	0	0	0	0	0	0	6	0	0	0	0/0
Thurston	1	4	1	0	0	1	1	1	3	45	2	2	0	0/#
Wahkiakum	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Walla Walla	0	1	0	0	0	0	0	0	0	1	0	1	1	0/18
Whatcom	2	13	0	1	2	0	1	5	1	52	14	0	0	0/#
Whitman	0	1	0	0	0	0	0	0	0	10	0	0	0	0/#
Yakima	0	16	1	1	0	0	1	0	1	81	18	1	1	1/11
Unknown														0/0

Current Month	13	123	14	6	16	2	22	65	28	1561	233	53	3	11/434
December 2002	27	172	63	17	16	3	15	153	28	1278	239	29	6	11/622
2003 to date	124	663	174	71	85	20	54	772	249	16796	2754	510	285	160/6765
2002 to date	166	655	230	162	83	27	76	574	252	14935	2924	453	253	172/7742

\* Data are provisional based on reports received as of December 31, unless otherwise noted.

† Unconfirmed reports of illness associated with pesticide exposure.

\$# Number of elevated tests (data include unconfirmed reports) / total tests performed (not number of children tested); number of tests per county indicates county of health care provider, not county of residence for children tested; # means fewer than 5 tests performed, number omitted for confidentiality reasons.



## WWW Access Tips

Information on the 5 a Day recommendations is available at [www.5aday.gov/](http://www.5aday.gov/).

## References

1. US Department of Agriculture. [www.ring.com/health/food/food.htm](http://www.ring.com/health/food/food.htm), January 2004.
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4. Smith-Warner SA, et al. Reliability and comparability of three dietary assessment methods for estimating fruit and vegetable intakes. *Epidemiology* 1997;8:196-201.

## Fruits and Vegetables *(from page 2)*

ongoing telephone survey of various health behaviors.<sup>3</sup>

Of the 1,895 households reached by interviewers, refusals to participate totaled 37%. Another 11% of potential respondents were unavailable or unable to participate (e.g., due to language barrier). Of the 1001 respondents (53%) who completed the survey, 84 questionnaires were discarded because of missing data. The sample included 917 respondents who completed two sets of questions about fruit and vegetable consumption. Approximately equal numbers of men (49%) and women (51%) participated. Participants were primarily white (nearly 92%) and most (76%) had at least some college education.

The first set of questions about fruit and vegetable consumption, the core questions from BRFSS, did not specify serving size. The instructions, stated: "These next six questions are about fruits and vegetables you usually eat. Please tell me how often you eat or drink each one, for example twice a week, three times a month, and so forth." Questions asked about fruit, fruit juice, green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, and other vegetables.

The second set of questions asked about the same fruits and vegetables, but added serving size information (i.e., one serving of fruit juice = 3/4 cup or 6 ounces; one serving of fruit = 1 medium apple, 1 banana, or 1/2 cup of cut fruit; one serving of green salad = 1 cup; one serving of

potatoes = 1/2 medium potato or 1/2 cup cooked potato; one serving of carrots = 1 medium carrot or 1/2 cup carrots; one serving of other vegetables = 1/2 cup).

For each set of questions, a scale was constructed by combining data from the answers in each set. The two scales reflected the different measures for reporting levels of fruit and vegetable consumption.

The specific wording of questions drastically affected the conclusions about consumption levels. While only about 26% (95% confidence interval, 23.3 to 29.5%) of respondents met the 5 a Day recommendations based on BRFSS-type measures, 50% (95% confidence interval, 46.5 to 53.5%) met these recommendations based on the measure that included a definition of serving size. One possible explanation is that in many cases, the serving size definitions of the Department of Agriculture are smaller than the serving sizes eaten by the respondents.

While the results of our survey indicate that providing portion size information impacts self-reports of fruit and vegetable consumption, further data are needed to determine the accuracy of these self-reports compared to actual consumption.

The widely used BRFSS survey provides state-specific estimates of fruit and vegetable consumption. Public health professionals should recognize the methodological limitations affecting the use of this survey to evaluate nutrition intervention programs. Methods for measuring fruit and vegetable development require further development to improve validity.

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